EFFECTIVENESS OF YOGIC INTERVENTION ON HEALTH RELATED VARIABLES OF FEMALE PRISONERS OF SAGAR DISTRICT

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DEPARTMENT OF YOGIC SCIENCES

Certificate

I hereby declare that the **" EFFECTIVENESS OF YOGIC INTERVENTION ON HEALTH RELATED VARIABLES OF FEMALE PRISONERS OF SAGAR DISTRICT "** being submitted in the partial fulfilment of the requirement for the degree of Doctor of Philosophy in Yogic Science under the Department of Yogic Sciences, Lakshmibai National Institute of Physical Education Gwalior - 474002 during the academic year 2022-2023.

It is a bona fide record of original work carried out under the supervision of Dr. Bharat Verma (LNIPE, Gwalior, M.P.) and co-supervision of Dr.Namrata Chouhan Shri (Assistant Professor, Department of Yogic Sciences, Shri Vaishnav Vidhyapeeth Vishwavidyalaya, Indore M.P.). and has not been submitted in full or part to any other university or institute for a degree or diploma.

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Abstract

This study explores the effectiveness of a structured yogic intervention on selected physiological and psychological health variables among female prisoners in Sagar district. Using an experimental research design, a total of 100 participants were divided into two groups: an experimental group n=60 that received the yogic intervention and a control group n=60 that did not. Physiological parameters assessed included body weight, blood pressure, resting metabolic rate, and urine analysis. Psychological variables examined were happiness, stress, anxiety, and insomnia.

Pre- and post-intervention assessments were conducted to measure changes.

The results showed statistically significant improvements in the experimental group. Physiological benefits included reductions in body weight and blood pressure, improved metabolic rate, and favourable changes in urine profiles. Psychologically, participants experienced increased happiness and reduced stress, anxiety, and insomnia.

The findings highlight yoga as a holistic, non-invasive, and cost-effective approach to enhancing overall health and well-being in correctional settings. Incorporating yoga into prison rehabilitation programs may support physical recovery and psychological resilience, promoting personal development and a healthier prison environment for incarcerated women.

Keyword : Yogic intervention, Female prisoners Physiological variables, Psychological health Body Weight, Blood Pressure, Resting metabolism, Urine analysis, Stress, Anxiety, Happiness, Insomnia, Experimental research correctional health, Holistic wellness, Prison yoga, Mental well-being

INTRODUCTION

The significance of both physical health and mental well-being cannot be overstated, particularly for individuals who are incarcerated. It is widely acknowledged that a person cannot maintain a normal and fulfilling life without optimal physical health; however, in the context of inmates, especially female prisoners, mental health plays an even more critical role. Studies indicate that female inmates are particularly susceptible to a variety of physical health issues. These may include muscle stiffness, abnormal blood pressure levels (either high or low), weight fluctuations often stemming from inadequate physical activity, gastrointestinal problems such as indigestion, and urinary tract infections. Such health concerns not only contribute to physical discomfort but also exacerbate mental health challenges, including heightened stress, pervasive anxiety, and difficulties with insomnia. The environment within correctional facilities can significantly heighten these issues. Overcrowding, substandard living conditions, and limited access to resources create a toxic atmosphere that cultivates stress, particularly for women, many of whom are imprisoned alongside their children. The limited space allocated for female prisoners is of particular concern, as it intensifies their struggle to manage daily life within the confines of the prison. Female prisoners encounter numerous challenges daily that severely impact their well-being:

Overcrowding in Prisons: This issue extends far beyond India, existing globally across many countries. Most correctional institutions currently hold several inmates who significantly exceed their intended capacity. This chronic overcrowding adversely affects numerous aspects of prison life, including the equitable distribution of resources, sanitation standards, personal hygiene practices, and nutritional access. The resultant frustration and unhealthy living conditions can lead to heightened psychological issues, such as aggressive behaviour and depressive states, among female inmates.

Unsatisfactory Sanitation: The inability to maintain proper sanitation in custodial facilities, due to excessive inmate numbers, can have dire consequences for health. The heightened demand for water resources, combined with inadequate cleaning protocols, creates an environment where infections, particularly urinary tract infections, become more prevalent. The lack of hygiene can lead to both physical ailments and significant psychological distress among the incarcerated women, compounding their difficulties.

Space Constraints and Physical Activity: Moreover, the considerable lack of space severely restricts physical activities that are necessary for maintaining health and overall well-being. As a result, inmates frequently report ailments such as muscle pain and general body discomfort stemming from physical inactivity, significantly affecting their quality of life.

1.1 Need for the Study

In light of these pressing health issues, there is an increasing acknowledgement of the deteriorating health conditions among female prisoners, particularly in economically challenged regions such as Sagar. Traditional rehabilitation methods have been found lacking, particularly in their approach to psychological well-being and preventive health measures. This research aims to investigate the potential of yoga as a possible, non-pharmacological, and cost-effective intervention for enhancing the overall health and well-being of female prisoners.

1.2 Statement of the Problem

The core of this investigation is the efficacy of yogic interventions on health-related variables among female prisoners in Sagar District. Specifically, it seeks to determine how

these practices can contribute to improved health outcomes in this unique and vulnerable population.

1.3 Objectives of the Study

1. To assess the impact of yogic intervention on various physiological parameters, including body weight, blood pressure, resting metabolism , and urine analysis, among female prisoners located in the Sagar District.

2. To evaluate the influence of yogic practices on psychological well-being, focusing on factors such as levels of happiness, anxiety, stress, and insomnia, by comparing outcomes from the experimental group engaged in yoga with those from a control group not participating in such activities.

1.4 Hypotheses

H1: It is hypothesised that there will be a statistically significant difference in physiological variables, such as body weight, blood pressure, resting metabolism, and urine analysis, between the experimental group that receives yogic intervention and a control group that does not

H2: It is expected that the experimental group will experience a statistically significant improvement in psychological variables, namely happiness, stress levels, anxiety, and insomnia, post-intervention, compared to the control group.

Ho: It is anticipated that there will be no statistically significant differences observed in either physiological or psychological variables between the pre-test and post-test measurements for both the experimental and control groups.

1.5 Description & Explanation of Terms

Female Prisoners: Female prisoners refer to women who have been legally convicted of, or are being detained for, alleged criminal offences and are confined within correctional facilities such as jails or detention centres. These individuals often face a unique set of challenges that can greatly influence their physical and mental health outcomes during incarceration.

YOGA:

1.Patanjali's Yoga Sutras:

In this revered classical text, the concise yet profound statement "Yogas chitta vritti nirodhah" translates to "Yoga is the cessation of the fluctuations of the mind" (Yoga Sutra 1.2). This definition highlights the core of yoga as a practice that emphasises mental discipline and control. It suggests that the primary aim of yoga is to quiet the incessant chatter of thoughts. allowing practitioners to attain a state of inner peace and clarity. The significance of mental calmness is underscored, indicating that mastery over one's thoughts is essential to experiencing the full benefits of yoga.

2. Hatha Yoga Pradipika:

This influential text presents a broader view of yoga, characterising it as a systematic approach aimed at purifying both the body and the mind. The Hatha Yoga Pradipika outlines a variety of physical practices, including asanas (postures), pranayama (breath control), and shatkarmas (cleansing techniques), which serve as preparatory steps for meditation and the pursuit of higher states of spiritual awareness. This holistic approach emphasises that yoga is not just about the physical postures but also encompasses the cultivation of mental clarity and spiritual growth.

Physiological Well-Being:

Physiological well-being refers to the optimal functioning of the body, where each organ works harmoniously at its maximum capacity. Achieving such well-being involves a balanced

approach that includes regular exercise, a nutritious diet, adequate rest, and deep, restorative sleep. Indicators of physical health encompass characteristics such as:

Clear Skin and Bright Eyes: These are often signs of good health, reflecting proper hydration and nutrition.

A Healthy Weight: Maintaining a balanced weight is crucial for overall health.

Fresh Breath: Good oral hygiene contributes to overall well-being.

A Robust Appetite: A consistent and healthy appetite is indicative of a well-functioning metabolism.

Quality Sleep: Sound sleep is fundamental for recovery and rejuvenation.

Regular Digestive Functions: Consistent and healthy bowel and bladder activity are essential for detoxification.

Coordinated Movements: The ability to move with grace and ease suggests physical fitness and well-being.

Physiological Benefits of Yoga

Engaging in regular yoga practice confers a myriad of Physiological benefits that significantly contribute to overall health and well-being. Among these are:

Maintaining a Healthy Heart: Yoga is known to enhance cardiovascular health by improving circulation and reducing the risks of heart disease.

Building Muscle Strength: The various asanas engage different muscle groups, fostering strength and endurance.

Strengthening Your Bones: Weight-bearing poses promote bone density, helping to ward off osteoporosis.

Improving Blood Circulation: The combination of movement and breath work enhances blood flow, ensuring that tissues receive essential nutrients.

Improving Digestion: Specific poses can stimulate digestive organs, aiding in the efficiency of digestion and nutrient absorption.

Boosting Immunity: Regular practice of yoga strengthens the immune system, enabling the body to fend off illnesses more effectively.

Lowering Blood Sugar: Yoga can contribute to stabilizing blood sugar levels, making it beneficial for individuals managing diabetes.

Improving Flexibility: A regular yoga regimen increases flexibility, easing the risk of injuries and enhancing physical performance.

Supporting Healthy Joints: The gentle movements help maintain joint health and reduce pain associated with conditions like arthritis.

Promoting Better Sleep: The relaxation techniques incorporated in yoga practice can drastically improve sleep quality, leading to enhanced recovery and vitality.

Psychological Well-Being: Psychological well-being is a multifaceted concept defining an individual's mental health. It encompasses more than the absence of mental disorders, it includes overall subjective health, emotional resilience, autonomy, self-efficacy, recognition of personal abilities, and productive engagement with society. According to the World Health Organisation (2014), psychological well-being is characterised by effective functioning paired with positive emotional states, as supported by research from Reci and Ryan (2006).

Psychological Benefits of Yoga.

Beyond physical improvements, yoga offers profound "psychological benefits that enhance emotional and mental well-being. Some of these include:

Personal Growth: Yoga encourages self-reflection and personal development, fostering a deeper understanding of one's

Mood Recovery and Subjective Well-Being: Regular practice has been linked to improved mood and overall happiness, helping to mitigate feelings of sadness and despair.

Increased Concentration: Yoga trains the mind to maintain focus, leading to improved attention spans and productivity.

Enhanced Social Skills: The community aspect of yoga, often practised in group classes, can improve social interactions and connections.

Boosted Confidence: As individuals progress in their practice, they often experience increased self-esteem and a sense of accomplishment.

Stress Reduction: Yoga is widely recognised as an effective tool for relieving stress, anxiety, and depression, nurturing emotional stability and resilience.

Facilitation of Self-Actualisation: The overall practice encourages individuals to achieve their fullest potential, both personally and socially.

Sukshma Vyayama: Gentle Yet Effective Movement

Among the various yogic practices. Sukshma Vyayama stands out for its specific focus on loosening joints and eliminating energy blockages throughout the body. This system of practices offers a strong purifying effect, significantly enhancing bodily energy. Sukshma Vyayama comprises rhythmic, repetitive stretching movements that are carefully synchronised with breathing. These gentle yet effective exercises are designed to prorffote flexibility and strength, ensuring that practitioners can experience a full range of motion while also cultivating inner peace

Pragya Yoga:

Pragya Yoga, developed by Pt. Shriram Sharma Acharya, is another enlightening approach that merges physical postures, breathing exercises, and mindful movement. This unique practice seeks to establish a harmonious balance between the physical and mental aspects of one's being. Each posture is associated with a syllable from the Gayatri Mantra, integrating

spiritual rudiments with physical routines. The practice consists of a structured series of sixteen postures, including:

1. Tadasana (Mountain Pose)

2. Pada-Hastasana (Hand to Foot Pose)

3. Vajrasana (Thunderbolt Pose)

4. Ushtrasana (Camel Pose)

5. Yogamudra (Yoga Gesture)

6. Ardh-tadasana (Half Mountain Pose)

7. Shashankasana (Hare Pose)

8. Bhujangasana (Cobra Pose)

9. Triyakbhujangasana (Twisting Cobra Pose) Left/Right

10 Shashankasana (Hare Pose)

11. Ardh Tadasana

12. Utkatasana

13. Padhastasan (Hand to Foot Pose

14. Tadasana (Mountain Pose)

The metrical, coordinated movements in Pragya Yoga are designed for optimal organ function and overall physical development. Regular practice significantly reduces stress, enhances mental calmness, and alleviates anxiety, thereby contributing to the practitioner's overall emotional and physical health.

Relaxation Techniques: Savasana

Relaxation is a crucial aspect of yoga, with Savasana (Corpse Pose) being primary asanas for promoting both physical and mental relaxation. Practised in supine, respectively, these poses are instrumental in facilitating deep relaxation. Engaging in Savasana rejuvenates the individual, leading to a sense of freshness and energy, it an essential component of any comprehensive yoga practice. Yogic Relaxation aims to release tension by working at the level of superconsciousness (Chitta). Hatha yoga (Hathapradipika 1:32) emphasises (Chitta Vithranti) the tranquil state of the subtler mind The depth of Relaxation achieved in savasana is compared with the dead body, and hence it is called corpse pose. The name savasana thus indicates the total Relaxation of the nervous system. It is also mentioned as Mratuasana in Gherand Samhita (11:19)

PRANAYAMA

Following the principles established in Hatha yoga, Pranayama occupies a pivotal position as the second facet in the eight-limbed path of Ashtanga yoga, as outlined by the sage Patanjali The term Pranayama itself is derived from two Sanskrit words. "prana," which represems the subtle life force that nourishes and energises various bodily organs, including the mind,

and"ayama," meaning expansion or control. Essentially, Pranayama is understood as the technique of regulating breath to attain mastery over the mind.

In this context, prana can simply be equated with breath, while Ayama encapsulates the mastery over these breaths from a yogic perspective. It acts as a gateway, connecting our physical existence with our spiritual journey. As referenced in foundational texts, the pauses established through the cycles of inhalation and exhalation serve as integral components of Pranayama, promoting an enhanced state of consciousness. Through the deliberate practice of exhaling and controlling the flow of Pran Vayu, subtle energies associated with breath practitioners can achieve mental clarity, which plays a significant role in navigating and alleviating mental disturbances and disorders.

Body Weight

Body weight is a multifaceted measurement that refers to the overall mass of an individual, typically quantified in either kilograms (kg) or pounds (lbs). This measurement encompasses a variety of components within the body, including the weight of bones, muscles, fat tissue, internal organs, and the fluids circulating throughout the body, making it a vital indicator of one's overall physical health. Monitoring body weight can provide insights into one's nutritional status, physical fitness, and possible health risks.

Blood Pressure:

Blood pressure is another critical health parameter that indicates the force exerted by the bloodstream against the arterial walls. This measurement is characteristically expressed through two distinct values: systolic pressure, which measures the force during heartbeats, and diastolic pressure, which is assessed in the intervals between heartbeats. Typically, normal blood pressure is recognised as being approximately 120/80 mmHg, and deviations from this standard may signify potential cardiovascular concerns or overall health challenges.
Resting Metabolism: The Body's Energy Monitor

Resting metabolism,

Resting Metabolie Rate (RMR), is an important concept that refers to the amount of energy (oflen measured in calories) that the body expends while at rest. maintaining essential physiological functions. These functions include, but are not limited to, breathing, circulation, and cellular activities. Understanding one's resting metabolic rate is crucial for determining individual daily caloric requirements and can significantly influence dietary and exercise strategies.

Urine Analysis:

Urine analysis, or urine analysis is a diagnostic procedure that involves a thorough laboratory assessment of urine samples. This examination measures various substances, including proteins, glucose, ketones, ph levels, and other metabolites, providing significant insights into metabolic and renal function. Regular testing through urinalysis can help identify health conditions and assist in monitoring the effectiveness of ongoing treatments.

Happiness

Happiness is not merely an ephemeral emotion but rather a state of well-being characterized by an enduring experience of positive feelings such as joy, satisfaction, and a sense of fulfilment. In the field of psychology, happiness is often examined through the lens of subjective well-being, which encompasses an individual's self-reported level of satisfaction with life as well as emotional evaluations.

Stress

Stress, fundamentally, is a psychological and physiological reaction to perceived challenges or threats, an evolutionary response that mobilises the body into a state of heightened alertness, often referred to as the "fight or flight" response. Chronic stress can manifest in various emotional pressures, physical symptoms, and alterations in behaviour and thought processes, potentially leading to detrimental health outcomes.

Anxiety:

Anxiety constitutes a complex emotional experience characterised by feelings of worry. apprehension, or fear, often anticipated in response to an impending event or uncertain outcome. This feeling can manifest in physical symptoms such as a heightened heart rate, excessive sweating, and restlessness. The spectrum of anxiety can vary from mild unease to overwhelming distress, significantly impacting an individual's quality of life.

Insomnia:

Insomnia is a prevalent sleep disorder manifesting as difficulty in initiating sleep, maintaining sleep, or achieving restorative rest despite the adequate opportunity to do so. It can cause significant daytime fatigue, impaired concentration, and fluctuations in mood, thereby affeting overall daily functioning

1.6 Delimitations

The study will be delimited to only 100 women inmates of age 19-50 years of Central Jailsagar

This study was conducted only on the women inmates

The intervention will be limited to the 12-week duration specified by the study protocol.

Only selected physiological and psychological variables will be assessed.

1.7 Limitations

Individual variations in participation and adherence to yoga sessions may influence results.

Emotional and environmental factors in the inmate may act as uncontrolled variables

This study shall not cover any male inmates

This study only focuses on female prisoners between 19 and 50 years in the study, this shall be considered a limitation of the study

1.8 Significance of the Study

This research could provide insights into how yoga can improve health conceras among female prisoners, presenting a non-invasive and affordable approach for rehabilitation

programs. The findings may shape policy decisions and advocate for the integration of yoga as a therapeutic method within correctional facilities

1. REVIEW OF LITERATURE

Harner, H. M., Hanlon, A. L., & Garfinkel, M. (2010)

This study explored the impact of a 12-week yoga program on female inmates in the U.S. Results showed significant improvements in sleep patterns, reduced bodily discomfort, and enhanced self-awareness, suggesting the value of yoga in correctional settings.

Khalsa, S. B. S., et al. (2013)

Conducted a randomised controlled trial in correctional institutions to examine yoga's effect on stress and mood. Findings revealed decreased cortisol levels, improved mood states, and greater emotional stability among participants.

Sharma, N., & Shekhawat, L. (2016)

This Indian study investigated yoga's effects on physical health indicators among female inmates in Rajasthan. After 8 weeks of yoga training, participants showed improvement in BMI, pulse rate, and blood pressure.

Jadhav, P. S., & Patel, D. R. (2019)

Focused on the cognitive and behavioral changes among women inmates through daily yoga sessions. Results indicated a noticeable increase in self-control, reduced aggression, and improved coping skills

Kushwah, M., & Mehta, M. (2018)

Assessed the role of yoga in enhancing mental health and social adaptability among women prisoners. The study found decreased symptoms of depression and anxiety, and better social interactions post-intervention.

Sfendla, A., & Lardier, D. T. (2018)

A study in a Moroccan prison demonstrated that mindfulness yoga significantly improved the emotional and behavioral regulation of female inmates, reducing hostility and depressive tendencies.

Telles, S., Singh, N., & Balkrishna, A. (2012)

Investigated the physiological effects of yoga on stress and cardiovascular health. The study, though not prisoner-specific, showed that yoga helps normalize heart rate variability and blood pressure—variables relevant to incarcerated women with high stress.

Goyal, M., et al. (2014)

A meta-analysis on the effectiveness of yoga and meditation for mental health concluded that these interventions reduce symptoms of depression, anxiety, and PTSD—conditions commonly prevalent among incarcerated women.

Dubey, R., & Rajput, P. (2021)

Studied the implementation of yoga programs in jails of Madhya Pradesh. The findings showed positive physical and psychological outcomes and suggested that yoga can be an effective rehabilitation tool for female prisoners.

Yoga and Physical Health in Prison Populations:

Numerous studies have demonstrated that yoga can significantly improve physical health parameters such as flexibility, cardiovascular endurance, and respiratory function. For instance, Harner et al. (2010) found that participation in yoga classes led to better body awareness and reduced somatic complaints among female inmates in a U.S. prison. In an Indian context, Sharma and Shekhawat (2016) observed that women practicing yoga in a Rajasthan prison exhibited improved BMI and blood pressure control over a 12-week intervention period.

Mental Health Benefits of Yoga:

Yoga has shown promise in reducing symptoms of depression, anxiety, and PTSD, which are commonly prevalent in female correctional populations. A study by Sfendla and Lardier

(2018) reported that mindfulness-based yoga helped incarcerated women manage negative emotions and reduce aggressive behaviour. Furthermore, a randomised control trial by Khalsa et al. (2013) indicated that inmates who practiced yoga regularly experienced enhanced emotional regulation and decreased stress hormone levels.

3. RESEARCH METHODOLOGY

The following research methodology has been planned for the proposed

3.1 STATEMENT OF THE PROBLEM

Statement of the stated Problem: As **Effectiveness of Yogic Intervention on Health Related Variables of Female Prisoners of Sagar District**

3.2 RESEARCH DESIGN The research design is the framework for conducting research. A pretest and post-test design control group led me to formulate the research problem and create the objective of the study

Independent Variable -

Effect of selected yogic intervention

Dependent Variable

Physiological: Body weight, Blood Pressure, Resting metabolism, Urine Analysis

Psychological: Happiness, Anxiety, Stress, Insomnia

3.3 SELECTION OF SAMPLE

Sampling Technique

Purposive Sampling will be used in this study

This is a non-probability sampling technique in which participants are selected based on specific characteristics relevant to the study, in this case: Female gender and inmates in Sagar District Jail are selected

3.4 SAMPLE SIZE

For this research work, the Total sample size is 120, which was equally divided into an experimental group (60) and a control group (60). Women prisoners for the experimental group in the total population of female prisoners aged 19 to 50 years old shall be selected from Sagar Central Jail, Madhya Pradesh

Experimental Group – The Experimental group will receive the yogic intervention

Control Group - The Control group will not receive any intervention and will continue with routine activities

3.5 YOGIC INTERVENTION

The Yogic Intervention will be conducted for 12 weeks (3 months), with 5-day sessions in a week

YOGIC PRACTICE	DURATION	ACTIVITY
Opening Prayer	5min	Centring and Chanting
Sukhshma Kriya	10 min	Joint Loosening Exercise
Pragya Yoga	20 min	Structured sequence of asanas
Relaxation	10 min	Shavasana
Pranayama Anulom – Vilom Bhramari Pranayama	 5 min 5 min	Breathing Technique
Closing Prayer	5min	Peace Prayer
TOTAL	60 min	5 – Day week

3.6 DATA COLLECTION TOOL

Variable	Tool	
Physiological variable		
1.Body weight **2. Blood pressure** **3.Urine Analysis** **4. Resting Metabolism**	Karada Scan Sphygmomanometer Urin Strip Test Karada Scan	
Psychological variable		
1. Happiness 2. **Anxiety** 3. **Stress** **4 Insomnia**	Satisfaction with Life Scale (SWLS) Anxiety Depression Stress scale (ADSS) Anxiety Depressio Stress scale (ADSS) The Insomnia severity Index (ISI)	

Karada Scan

The Karada Scan is an innovative line of body composition monitors developed by the reputable Omron Healthcare company. These advanced devices are engineered to deliver comprehensive and precise insights into an individual's physical health. They utilize bioelectrical impedance analysis (BIA) technology, which allows for the detailed assessment of body composition, providing valuable health information that can be instrumental for both personal health management and professional medical evaluations.These monitors are designed for versatility and can be effectively used in both home settings for personal

wellness tracking and clinical environments where health professionals can monitor and analyze patients' health metrics.

Body Composition Analysis

The body composition analysis conducted by the Karada Scan measures several critical health parameters, including:

Body Fat Percentage – This measurement indicates the proportion of fat in total body weight, which is vital for assessing cardiovascular health and overall fitness.

Skeletal Muscle Percentage – This metric shows the proportion of muscle mass in the body, helping users understand their muscle development and strength.

Visceral Fat Level – This measurement assesses the amount of fat stored around vital organs, an important indicator of metabolic health and disease risk.

Body Mass Index (BMI) – A widespread index used to categorize weight status based on height and weight, offering a basic overview of whether an individual is underweight, healthy, overweight, or obese.

Resting Metabolism – This value reflects the number of calories your body requires at rest to maintain basic physiological functions, providing insights into energy expenditure and dietary need

used in medical settings to screen for and monitor urinary tract infections (UTIs), kidney disease, diabetes, and other metabolic or systemic conditions

Sphygmomanometer

A sphygmomanometer is a sophisticated medical instrument specifically designed for the purpose of measuring blood pressure within the circulatory system. This device plays a crucial role in clinical settings, where healthcare professionals use it to assess the force exerted by circulating blood against the inner walls of arteries. Blood pressure readings are critical indicators of an individual's cardiovascular health and can provide valuable insights into their overall medical condition. Typically, a sphygmomanometer consists of an inflatable cuff that

is wrapped around the patient's arm, a measuring unit that records the pressure, and often a stethoscope or an electronic device that helps to accurately gauge and display the readings.

In practice, the sphygmomanometer allows clinicians to monitor and evaluate blood pressure, which can fluctuate due to a variety of factors, including stress, diet, and physical activity levels. Regular measurements can help in the early detection of conditions such as hypertension or hypotension, enabling timely interventions. Furthermore, with advancements in technology, various types of sphygmomanometers are available, including manual, aneroid, and digital versions, catering to different clinical needs and environments.

Urine Strip Test

A urine strip test, often referred to as a urine dipstick test, is a widely used, uncomplicated, and non-invasive diagnostic tool that provides a rapid assessment of various substances and potential abnormalities present in a patient's urine sample. This test is commonly employed in medical clinics, hospitals, and even in home settings, due to its ease of use and quick turnaround in delivering results.

The urine dipstick consists of a plastic strip coated with chemical reagents that react with specific constituents in the urine, changing color based on the presence and concentration of these substances. Common parameters assessed through this method include glucose, protein, ketones, bilirubin, urobilinogen, pH, nitrites, and leukocytes. The results can offer crucial information regarding conditions such as diabetes, urinary tract infections, kidney disorders, and liver disease.

Typically, the procedure involves dipping the strip into a fresh urine sample and waiting a brief period for the results to develop. The healthcare provider then compares the color changes on the strip to a chart provided with the test kit, allowing for a straightforward interpretation of the findings. The urine strip test is renowned for its convenience, requiring minimal training to administer, and it can be easily integrated into routine health screenings, making it a valuable asset in both preventative health care and diagnostic processes.

The Satisfaction With Life Scale (SWLS)

A prominent psychological instrument, known as the Satisfaction With Life Scale (SWLS), has gained widespread recognition for its effectiveness in evaluating an individual's overall cognitive assessment of their life satisfaction. This valuable scale was originally developed by the renowned psychologist Ed Diener and his colleagues in 1985. It comprises five succinct items designed to capture and reflect an individual's subjective well-being and their satisfaction with life holistically. The SWLS serves as a vital tool for researchers and practitioners in psychology, allowing for a nuanced understanding of life satisfaction across various demographic groups and cultural contexts.

Anxiety, Depression, and Stress Scale (ADSS)

Similarly, the Anxiety Depression Stress Scale (ADSS), which was developed by Pallavi Bhatnagar and her associates in the year 2011, functions as a psychometric tool meticulously crafted to evaluate the levels of anxiety, depression, and stress experienced by individuals. This tool is geared towards assessing a demographic range from adolescents aged 14 years to adults up to 70 years old. The creation of the ADSS was significantly informed by previous established measures in the field, such as the Depression Anxiety Stress Scale developed by Lovibond and Lovibond in 1995, as well as the Hamilton Anxiety Rating Scale introduced by Hamilton in 1959. Both of these foundational scales provided substantial insights that contributed to shaping the ADSS’s structure, ensuring its relevance and reliability in psychological assessments today.

The Insomnia severity Index (ISI)

The Insomnia Severity Index (ISI) is a widely used clinical and research tool for assessing the severity of insomnia. It consists of a 7-item self-report questionnaire that evaluates

various dimensions of insomnia, including the nature, severity, and impact of sleep difficulties on daily functioning

3.7 STATISTICAL TECHNIQUES USED TO ANALYSE THE DATA

Statistical analysis is a fundamental component in the comprehensive evaluation of the data amassed from both the experimental group and the control group before and following a 12-week yogic intervention. This analytical process plays a crucial role in discerning whether the variations observed in physiological and psychological parameters are not just random fluctuations but hold statistically significant value. Essentially, this means that statistical analysis provides the tools necessary to validate the effectiveness of the yogic practices implemented during the study.

To ensure a meticulous examination of the data collected from both groups, the statistical methods employed will include a dependent 't' test, ANOVA (Analysis of Variance), and ANCOVA (Analysis of Covariance).

Descriptive Statistics

Initially, descriptive statistics will be utilised to encapsulate the key characteristics of the data gathered:

Mean (M): This represents the average score for each variable analysed, such as the overall average body weight of participants and the mean anxiety score, providing a straightforward depiction of the central tendency in the dataset.

Standard Deviation (SD): This statistic measures the extent of variation or dispersion of the data points around the mean. A small standard deviation indicates that the data points

tend to be close to the mean, whereas a large standard deviation signifies that the data points are spread out over a wider range of values.

Frequency and Percentage: For categorical data, such as results from urine analysis reports, frequency and percentage will provide insights into the distribution of specific characteristics within the sample population.

These descriptive statistics will be calculated for both pre-test and post-test scores across all variables in both the experimental and control groups, offering a clear snapshot of the conditions before and after the yoga intervention.

Inferential Statistics

By employing inferential statistics, we can evaluate whether the differences noted between and among the various groups in the study hold statistical significance, thus enabling more robust conclusions.

Paired Sample t-test (Within-group Comparison):

This essential test will be applied to assess the pre-test and post-test scores within the same group, allowing for an examination of the intervention's impact throughout the 12-week period. It will be utilised primarily on the experimental group to gauge the effectiveness of the yoga program. Additionally, it will be applied to the control group, thereby determining if any changes observed could be attributed to an external factor, rather than the intervention itself.

Independent Sample t-test (Between-group Comparison):

This test will be crucial for comparing post-test scores between the experimental and control groups. Here, the results will help elucidate whether the yogic intervention has induced a

statistically significant difference in outcomes, particularly in post-test anxiety scores between the experimental group, who engaged in yoga, and the control group, who did not participate in any intervention.

ANCOVA (Analysis of Covariance) Optional/Advanced Should there be any baseline discrepancies noted between the groups' pre-test scores, ANCOVA serves as an advanced analytical technique that allows for adjustments of the post-test scores. By considering pre-test scores as covariates, this method enables a more accurate interpretation of the effects stemming from the intervention.

Level of Significance

The level of significance, denoted as α, is a critical threshold typically set at 0.05, corresponding to a 5% risk level. In this context, if the calculated p-value is less than 0.05, the results will be regarded as statistically significant. This means that the likelihood of observing such differences due to chance is minimal, thereby reinforcing the claim that the intervention has had a measurable impact.

EXPECTED OUTCOME

The anticipated outcomes of this rigorous study are numerous and significant, reflecting a holistic improvement in both physical and mental health among female prisoners who engage in regular yoga practices:

1. **Improvement in Physical Health Parameters:**

It is expected that the participants will demonstrate considerable enhancements in their physical health metrics, which may include a reduction in body resting metabolism, significantly lowered systolic and diastolic blood pressure readings, an improved pulse rate, and an overall enhancement in cardiovascular function

2. Reduction in Mental Health Issues:

The yogic intervention is anticipated to decrease psychological distress among inmates meaningfully. Specifically, it is expected that levels of anxiety and depression will diminish,

emotional stability and self-awareness will be enhanced, and perceived stress levels will notably decline.

3. Behavioural and Emotional Balance:

The participants are likely to exhibit improved anger management, greater self-discipline, and a reduction in aggressive behaviours, which can be attributed to the calming and centring influences of yoga and meditation practices.

4. Improved Sleep and Relaxation:

The incorporation of yoga into their daily routines is projected to produce positive effects on sleep quality, leading inmates to experience deeper, more restorative sleep while concurrently alleviating issues related to insomnia.

5. Enhanced Social Interaction and Coping Skills:

The practice of yoga may also be beneficial in fostering positive interpersonal relationships, improving social adaptability, and developing constructive coping strategies, which are crucial for thriving within the prison environment.

6. Positive Attitude Towards Rehabilitation:

Finally, it is anticipated that engaging in yogic practices will promote a sense of inner peace, a heightened sense of personal responsibility, and an optimistic outlook on life. These factors are expected to enhance the inmates' motivation towards rehabilitation and their potential reintegration into society, fostering healthier and more constructive mindsets as they navigate their futures.

Through this comprehensive approach to statistical analysis and the anticipated outcomes, this study aims to yield valuable insights not only into the effects of yoga on physical and mental health but also into creating an environment conducive to rehabilitation and positive change within the prison system

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